TECHNICAL MEMORANDUM

To:	**Ashleigh Crompton, Mike Champion, Jackie Boruch, Ryan Schucroft, Jamie Maxwell (Woodfibre LNG)**	**Date:**	**27 April 2024**
From:	**Patrick Mueller and Holly Pelletier (Lorax)**	**Project #:**	**A633-7**
Subject:	**PE-111578 Weekly Discharge and Compliance Report #10 for April 14 – April 20**		

Waste Discharge Authorization Effluent Permit PE-111578 was issued by the British Columbia Energy Regulator (BCER) to Woodfibre LNG on February 9, 2024. The permit specifies monitoring and reporting requirements that are required to be met by Woodfibre LNG during construction of the LNG Export Facility. Reporting is required on a weekly basis.

This technical memorandum (Report #10) summarizes the results of PE-111578 discharge and compliance monitoring conducted April 14 – April 20. Figures referenced in the report discussion are included at the end of this report. Report #10 has been prepared to meet the reporting requirements specified in Condition 4.2 of WDA Effluent Permit PE-111578:

> "The Permittee shall summarize the results of the discharge and compliance monitoring program in a report that shall be submitted to the BCER weekly over the term of this permit. Reports must include suitable tabulated data. The table must include any applicable regulatory limits/guidelines e.g. permit limits, BC Water Quality Guidelines etc. Any exceedances of respective regulatory limits/guidelines must be clearly highlighted. Any missed sampling events/missing data must be identified with an explanation provided. Reporting frequency may be reduced upon a history of compliance and by written confirmation from the BCER. These reports shall be submitted to Waste.Management@bc-er.ca. A copy of the reports shall be provided to each First Nation consulted with regarding this subject permit, and also made publicly available on the Woodfibre LNG Environmental Reporting webpage."

1. Current Conditions

The Construction Phase of the Woodfibre LNG Export Facility commenced in October 2023. Early stage civil works are ongoing such as site grading, levelling, and sedimentation pond and wastewater treatment plant (WWTP) construction. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure was initiated and has continued through the April 14 – April 20 monitoring period. The water management facilities described in PE-111578 that are completed or that were under construction during the reporting period are shown in Figure 1.

Construction of the East WWTP and Sedimentation Pond have been completed (Figure 2). The permanent sedimentation pond outfall structures are planned to be completed late May. Until those structures are constructed, a temporary discharge system (*i.e.*, pump, hosing and diffusor) has been established to convey East Sedimentation Pond effluent to the authorized discharge location when necessary for the discharge of excess water, and if the effluent water quality meets the requirements set out in PE-111578. The East Catchment conveyance ditches will be constructed following site preparation activities (*e.g.*, site grading, bedrock excavation) along the ditch lines. During the interim period, non-contaminated contact water will be pumped to the East Sedimentation Pond for TSS settling prior to discharge.

During the reporting period (April 14 – April 20) pilot testing of the East WWTP was ongoing and a total 3,072 m^3 of contact water was treated by the East WWTP. Contaminated and non-contaminated contact water stored on-site was directed to the East WWTP for treatment, and the treated effluent was discharged to the East Sedimentation Pond.

Discharge from the East Sedimentation Pond to Howe Sound commenced April 15. The pond discharged intermittently by pumping during day shift, from April 15 – 17 and on April 20. A total of 1,699 m^3 of water was discharged during the reporting period (April 14 – April 20).

Construction of the West Sedimentation Pond was largely complete during the reporting period (April 14 – April 20), except for the outfall structure (Figure 4), and assembly of the West WWTP was ongoing. Commissioning of the West WWTP is planned to begin by the end of April. The West Catchment conveyance ditches will be constructed following site preparation activities (*e.g.*, site grading, bedrock excavation) along the ditch lines. There were no discharges from the West Sedimentation Pond to the receiving environment during the reporting period.

The completed non-contact water diversion ditch west of Mill Creek (Figure 1) was commissioned for use on April 7. The diversion ditch discharges to Mill Creek at OUT-06 (Figure 1) and no non-contact water flows were reported by site staff during the reporting period. Monitoring stations OUT-01 and OUT-02 for the clean water diversion ditch outlets have been established and added to Figure 1.

2. Monitoring Summary

The PE-111578 authorized works were under construction during the April 14 – April 20 monitoring period. Compliance monitoring stations are progressively established as water management infrastructure is completed. The following monitoring stations have been established (Figure 1):

- Creek water (SW-01, SW-02, SW-03, SW-04, SW-07).
- Howe Sound reference and IDZ locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).

- Non-contact diversion ditch outlets (OUT-01, OUT-02 and OUT-06).
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2 and SP-E-OUT).

Samples collected during the monitoring period (April 14 – April 20) are summarized in Table 1. Stations WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, IDZ-E1, and IDZ-E2 were scheduled for monitoring. Monitoring was conducted by Roe Environmental.

Table 1: Summary of PE-111578 monitoring samples collected April 14 – April 20.

Sampling Date	Sample	Description	Parameters Tested
April 16, 2024	SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, dioxins and furans, glycols, oil and grease. Methyl mercury tested in SP samples only
	SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)	
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
	IDZ-E1-0.5	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface	Field, Physical, and General Parameters, Total and Dissolved metals, Hexavalent Cr
	IDZ-E1-2m	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface	
	IDZ-E1-SF	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor	
	IDZ-E2-0.5	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface	
	IDZ-E2-2m	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface	
	IDZ-E2-SF	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor	
April 17, 2024	SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond	Field parameters
	SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)	
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
April 18, 2024	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	Field parameters
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
	SP-E	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	PAHs
April 19, 2024	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	Field parameters
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
April 20, 2024	SP-E-Out	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)	Field parameters
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	

3. Water Quality Results

3.1 Overview

Analytical results that were available at the time of reporting are listed below in Table 2. Methyl mercury, dioxins and furans results were not available at the time of reporting and will be included in future weekly reports when they are available for:

- OUT-06 collected April 12 (methyl mercury);
- SP-E-IN-2 and SP-E-OUT collected April 16 (methyl mercury, dioxins and furans); and
- WWTP-E-IN and WWTP-E-OUT collected April 16 (dioxins and furans).

Table 2: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #10.

Sample	Description	Sampling Date	Parameters Reported
OUT-06	Non-contact water diversion ditch outlet	April 12, 2024	Field, Physical, and General Parameters, Total and Dissolved metals
SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond	April 16, 2024	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, and methyl mercury (SP samples only)
SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)		
WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area		
WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond		
IDZ-E1-0.5	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface		Field, Physical & General Parameters, Total and Dissolved Metals, Hexavalent Cr
IDZ-E1-2m	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface		
IDZ-E1-SF	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor		
IDZ-E2-0.5	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface		
IDZ-E2-2m	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface		
IDZ-E2-SF	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor		
SP-E	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	April 18, 2024	PAHs

3.2 East Sedimentation Pond

The East Sedimentation Pond influent and effluent results are screened against PE-111578 discharge limits. Parameters without a discharge limit are screened against BC and Federal water quality guidelines (WQGs) for the protection of marine water aquatic life. Influent water is not discharged from site, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters, discharge limits and WQGs are summarized in Appendix B.

The April 16 effluent sample (SP-E-OUT) meets PE-111578 discharge limits. Parameters without discharge limits met WQG except, benzo(a)pyrene which was detected at 0.0000114 mg/L, 1.14 times above the WQG value of 0.00001 mg/L (Table 3). This concentration is in the range of baseline values observed in marine water samples and the mixing zone model indicates the concentration would be diluted to below the WQG within several metres of the outfall location and within the initial dilution zone defined in PE-111578. An in-pond sample (station SP-E-POND) was collected April 18 proximal to the intake for the effluent discharge pump located in the northeast corner of the pond and tested for PAHs. The results indicate the PAH WQGs were met in the April 18 sedimentation pond sample.

The influent sample collected April 16 at SP-E-IN-2 had elevated concentrations of PAHs (Appendix B) suggesting contaminated contact water was entering the East Sedimentation Pond. Following receipt of the analytical results on April 18, site staff suspended further discharges from the pond, collected a follow-up water quality sample proximal to the effluent pump intake in the northeast corner of the pond, and investigated the source of the influent water. The April 16 influent water had been pumped from a non-contaminated contact water storage tank. It was determined that influent was stored in a tank that was previously used to store contaminated contact water and that residues from the tank were likely entrained in the water that was transferred from the baker tank to the pond influent.

Site reports indicate water management corrective actions were implemented April 18 and included recirculating water through the East WWTP from the baker tanks used for storing non-contaminated contact water to remove contaminate residues from the tanks, recirculating sedimentation pond water through the WWTP to remove residual PAHs from the pond water, and suspending discharge until analytical results of the April 18 pond sample (SP-E-POND) were received April 20 and PAHs were confirmed to be below WQG.

Table 3:
Summary of WQG Exceedances for the East Sedimentation Pond at Effluent Station SP-E-OUT and Pond Water Station SP- E-POND.

Parameter	Units	WQG (LT)	N	N >WQG	Commentary
Benzo(a)pyrene	mg/L	0.00001 (BC)	2	1	The benzo(a)pyrene concentration was 1.14 times greater than the long-term BC WQG in the sample from SP-E-OUT collected on April 16 (0.0000114 mg/L). Discharge from the East Sedimentation Pond was halted on April 17. This concentration is in the range of baseline values observed in marine water samples and the mixing zone model indicates the concentration would be diluted to below the WQG within several metres of the outfall location and within the initial dilution zone defined in PE-111578. Sampling of the pond supernatant (SP-E-POND) on April 18 showed PAH concentrations met WQG. Discharge resumed on April 20, after the April 18 sample results were received.

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term freshwater or estuarine aquatic life guideline. Variable dependant guidelines were calculated for each sample using sample specific parameter values. The nearest boundary value was used if a variable was outside the formula range.
N = number of samples.
Non-detect results are screened using the detection limit value.

3.3 East Wastewater Treatment Plant

The East WWTP influent and effluent results are screened against the minimum discharge objectives (MDOs) which the WWTP was designed to meet. Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet MDOs, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters and MDOs are summarized in Appendix C.

Pilot test results indicate the East WWTP effectively treats parameters of potential concern to concentrations that meet the MDOs for treatment. The samples collected April 16 from the East WWTP influent and effluent stations (WWTP-E-IN-2 and WWTP-E-OUT, respectively) also demonstrate the treatment effectiveness with influent concentrations of numerous total metals and PAHs above the MDO values, whereas concentrations of all parameters in the effluent were below the MDOs.

3.4 Freshwater and Estuarine Water Receiving Environment

Freshwater and estuarine water receiving environment samples are screened against BC and Federal WQG for the protection of freshwater or estuarine water aquatic life. The analytical results, field parameters and WQGs are summarized in Appendix D.

The WQG screening results for the April 12 non-contact diversion ditch outlet (OUT-06) sample are summarized in

Table 4 for parameters that exceed a guideline. Parameter concentrations meet WQGs, except total aluminum (T-Al) and dissolved copper (D-Cu). The concentrations of T-Al and D-Cu are within the concentration ranges observed in the baseline monitoring program in Mill Creek.

Table 4:
Summary of WQG Exceedances for Freshwater and Estuarine Analytical Samples Collected April 12, 2024.

Parameter	Units	WQG (LT)	N	N >WQG	Commentary
Total Aluminum	mg/L	0.086 (BC) 0.26 (Federal)	1	1	The total aluminum concentration was above the long-term BC WQG in the sample from OUT-06 collected on April 12 (0.190 mg/L). The observed total aluminum value is within the ranges observed in pre-construction baseline samples in Mill Creek.
Dissolved Copper	mg/L	0.00030 (BC) 0.00058 (Federal)	1	1	The dissolved copper concentration was above the long-term BC and Canadian WQG in sample from OUT-06 collected on April 12 (0.00090 mg/L). The observed dissolved copper value is within the ranges observed in pre-construction baseline samples in Mill Creek.

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term freshwater or estuarine aquatic life guideline. Variable dependant guidelines were calculated for each sample using sample specific parameter values. The nearest boundary value was used if a variable was outside the formula range.
N = number of samples.
Non-detect results are screened using the detection limit value.

3.5 Marine Water Receiving Environment

Marine water receiving environment samples are screened against BC and Federal WQG for the protection of marine water aquatic life. The analytical results, field parameters and WQGs are summarized in Appendix E. Screening results are summarized in Table 5 for parameter concentrations that are above a guideline value.

Weekly initial dilution zone (IDZ) monitoring for field and physical parameters was conducted April 16 in accordance with the requirements specified in Table 2 of PE-111578. Water column samples were collected at stations IDZ-E1 and IDZ-E2 at 0.5 and 2 m below the water surface and 2 m above the seafloor. Total and dissolved metals were also tested to obtain additional information on these parameters.

Results for all samples are within WQG values, except for dissolved oxygen (DO) and total boron (T-B). The concentration of DO was below the minimium WQG level (8.0 mg/L) in one deep-water sample at station IDZ-E2 (7.34 mg/L). The concentrations of total boron ranged from 1.31 to 3.70 mg/L in all samples. The concentrations of DO and total boron observed in the IDZ-E1 and IDZ-E2 samples are within the concentration ranges observed in the pre-construction baseline monitoring program.

Laboratory detection limits for total cadmium, chromium, copper, nickel, selenium, vanadium and zinc were raised above WQG values for the IDZ-E1 and IDZ-E2 samples. The samples were collected and analyzed using a less sensitive method than normally used for seawater testing. This resulted in metal detection limits that were elevated above WQG. Moving forward, site staff indicate metal samples will be collected and tested using a more sensitive method specific for seawater samples.

Table 5:
Summary of WQG Exceedances for Marine Water Analytical Samples Collected April 16 and 18, 2024.

Parameter	Units	WQG (LT)	Location	N	N >WQG	Commentary
Field Dissolved Oxygen (DO)	mg/L	≥ 8.0 (Federal)	Surface	4	0	Field DO was below the lower limit of the WQG in the deep-water sample collected from IDZ-E2 (7.34 mg/L). Depletion of DO has been documented for the deep waters of Howe Sound and the observed DO values are within the ranges observed in deep water pre-construction baseline samples at these stations.
			Deep	2	1	
Total Boron	mg/L	1.2 (BC)	Surface	4	4	Total boron exceeded the WQG in the surface water and deep-water samples at station IDZ-E1 and IDZ-E2. Total boron concentrations range from 1.31 to 3.70 mg/L. This is due to the influence of oceanic marine water in Howe Sound. The observed total boron values are within the ranges observed in pre-construction baseline samples at these stations.
			Deep	2	2	
Total Cadmium	mg/L	0.00012 (BC and Federal)	Surface	4	2	The total metal analysis was processed using a less sensitive test method than is normally used for seawater testing. This resulted in detection limits that were elevated above WQG for cadmium, copper, lead, nickel, selenium, vanadium, and zinc. These metals were not detected in the samples. Total and dissolved metals will be tested using the low level test method specific for seawater moving forward to achieve the typically reported detection limits.
			Deep	2	1	
Total Copper	mg/L	0.002 (BC)	Surface	4	4	
			Deep	2	2	
Total Lead	mg/L	0.002 (BC)	Surface	4	2	
			Deep	2	1	
Total Nickel	mg/L	0.0083 (BC)	Surface	4	4	
			Deep	2	2	
Total Selenium	mg/L	0.002 (BC)	Surface	4	2	
			Deep	2	1	
Total Vanadium	mg/L	0.005 (Federal)	Surface	4	4	
			Deep	2	2	
Total Zinc	mg/L	0.01 (BC)	Surface	4	4	
			Deep	2	2	

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term marine aquatic life guideline.
N = number of samples.
Non-detect results are screened using the detection limit value.

4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 7). The evaluation includes a review of field and lab QC, completeness of the weekly report (*i.e.*, pending data), completeness of the monitoring program and review of water management activities. Any items flagged for follow-up will be carried forward in future reports until they are closed.

Table 6: Summary of Weekly Report QC Evaluations and Ongoing Items.

QC Procedure	Observation	Investigation/Resolution
Reporting Period (April 14 – April 20, Report #10)		
Monitoring Program Evaluation	PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established.	The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is under construction. The West Sedimentation Pond is not commissioned for discharge and did not discharge. The non-contact water diversion ditch that discharges at station OUT-06 was commissioned for discharge on April 7, and stations for pre-existing outfalls OUT-01 and OUT-02 have also been established.
Water Management Evaluation	April 16 monitoring results for East Sedimentation Pond influent (station SP-E-IN-2) indicated contaminated contact water was directed to the pond.	The April 16 SP-E-IN-2 results were received April 18 and indicate the influent water had concentrations of numerous PAHs above the WQG. Benzo(a)pyrene in the effluent (station SP-E-OUT) was reported as 0.0114 µg/L, 1.14 times above the WQG of 0.01 µg/L. Discharges occurred during the day from April 15 – 17. Further discharge was suspended on April 18, after receiving the lab test results. On April 16, non-contaminated contact water that was previously pumped to a baker tank for storage was transferred to the sedimentation pond as influent. On April 18, after receiving the test results, site staff determined that the baker tank was previously used to store contaminated contact water and that residues from the tank were likely entrained in the water that was transferred from the baker tank to the pond influent. Corrective actions were implemented by site staff on April 18 and included suspending further discharges until WQ monitoring indicated PAHs have been removed from the sedimentation pond, and recirculating water from the baker tanks used for storing non-contaminated contact water through the East WWTP until influent PAH concentrations indicate residual contamination has been removed. Site staff collected a pond sample on April 18 proximal to the intake for the effluent discharge pump located in the northeast corner of the pond (SP-E-POND). PAHs met WQG in the April 18 sedimentation pond sample. This item remains open pending the results of additional influent monitoring scheduled for the week of April 21.
Pending Data	Methyl mercury results for April 12 (OUT-06) and April 16 (SP-E-IN-2 and SP-E-OUT), and dioxin and furan results for April 16 (IDZ-E1 and IDZ-E2) were not reported.	Methyl mercury, dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected mid-May. This item remains open.
Result QA/QC Screening	Detection limits for total Cd, Cu, Pb, Ni, Se, V, and Zn were raised above WQG values for the IDZ-E1 and IDZ-E2 seawater samples.	The total and dissolved metal analysis was processed using a less sensitive test method than normally used for seawater testing. This resulted in detection limits that were elevated above WQG for Cd, Cu, Pb, Ni, Se, V, and Zn. Site staff indicate total and dissolved metals will be tested using a higher sensitivity method for seawater moving forward to achieve the typically reported detection limits. Additional sampling is scheduled for the week of April 21 at these stations. This item remains open until future lab submission reports confirm the higher sensitivity test method is used for seawater metals testing.
Ongoing Items from Previous Weekly Reports		
Report #7: Result QA/QC Screening	Chloroform was detected at two to three times the detection limit in field blanks collected March 19, 20 and 21.	Chloroform was not detected (<0.0005) in all March monitoring samples. Investigation of the chloroform results reported for the March field blanks confirmed the water provided by the laboratory for field blank preparation was the likely source of the chloroform detected in the blanks. Additional measures have been implemented by the laboratory to ensure that water supplied for field blanks is free of chloroform. Chloroform was not detected in field blanks collected in April, indicating the additional measures implemented by the laboratory were effective. This item is now closed.

Notes:
Result QA/QC screening includes the evaluation of field and lab QC results, comparison of total and dissolved metal results and review for modified detection limits.
Pending data are outstanding results from monitoring samples reported in the current or previous weekly reports.
Monitoring program evaluation is an assessment of the completeness of the monitoring program compared to PE-111578 requirements.

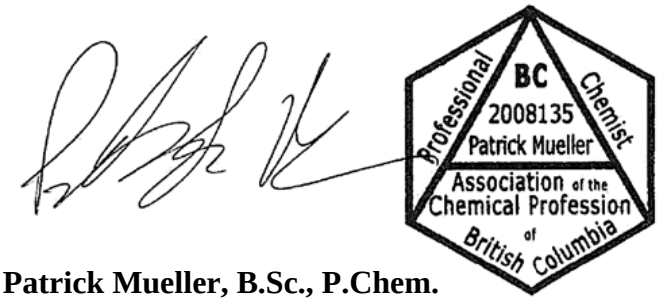
5. Closure

This weekly report is a desktop review by Lorax of the PE-111578 discharge and compliance monitoring program records, reports and results provided by Woodfibre LNG and their sub-contractors. The records reviewed and analyzed by Lorax include ALS Environmental laboratory test reports, site reports (from Roe Environmental, LB LNG, McDermott and Woodfibre LNG), and Keystone Environmental field reports. Verbal or electronic communications between Lorax, and Roe Environmental, LB LNG, McDermott, Woodfibre LNG and Keystone Environmental staff are conducted as needed to confirm the information presented in this report.

Regards,

LORAX ENVIRONMENTAL SERVICES LTD.

Holly Pelletier, B.Sc., GIT
Environmental Geoscientist



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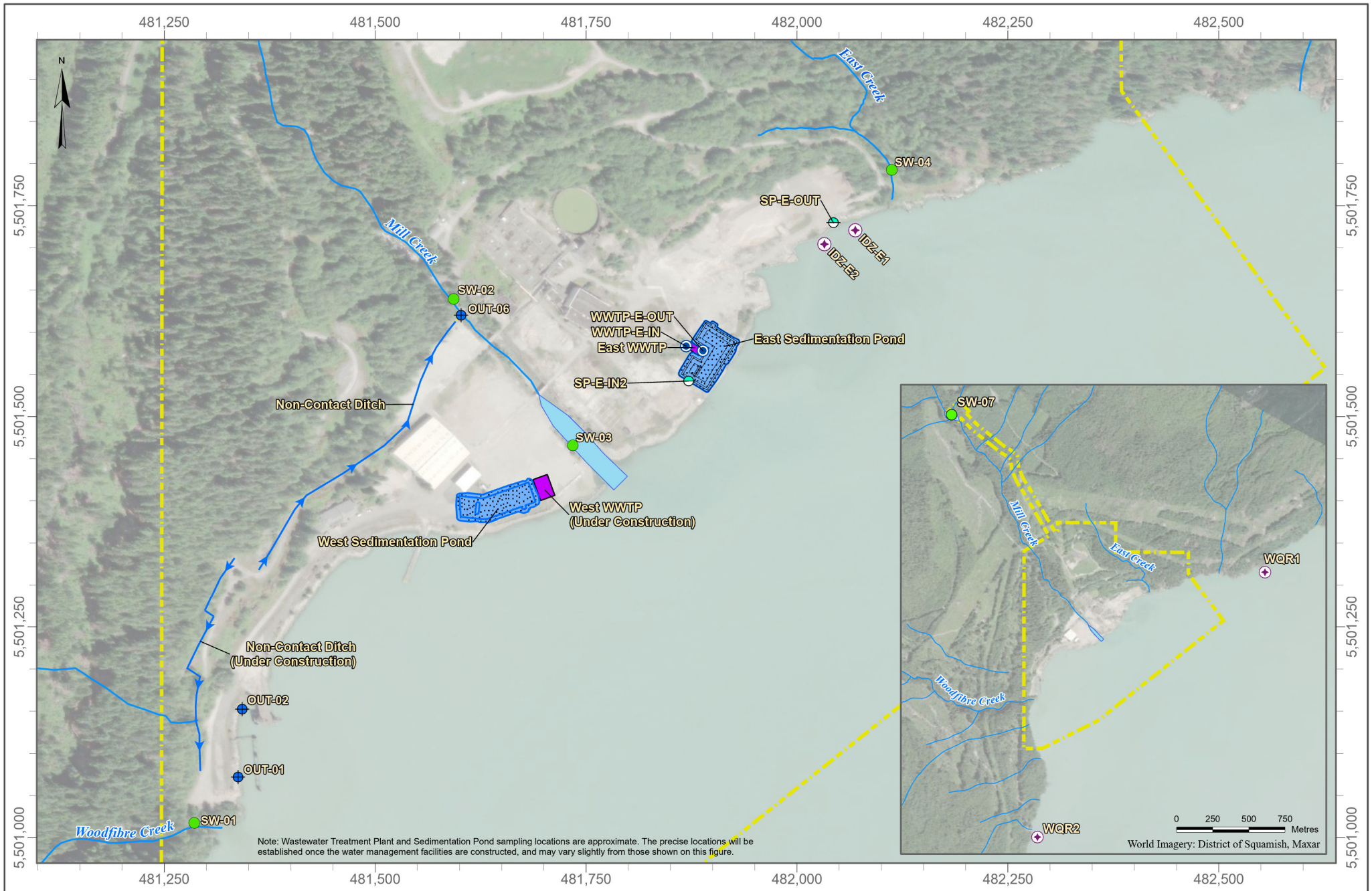

LEGEND

- Freshwater Monitoring Station
- Marine Water Monitoring Station
- Certified Project Area
- Waterbody
- Watercourse
- Non-Contact Diversion Ditch
- Clean Water Diversion Discharge Station
- Sediment Pond
- Sediment Pond Monitoring Stations (Water Quality)
- WWTP

DATE SAVED:	Apr 27, 2024
DRAWN BY:	DM
REVIEWED:	PM
VERSION:	1

Coordinate System: *NAD 1983 UTM Zone 10N*
Projection: *Transverse Mercator*
Datum: *North American 1983*
Units: *Metre*

1:6,000

0 50 100 150 Metres

CLIENT: Woodfibre LNG

LORAX ENVIRONMENTAL

PROJECT:

Woodfibre LNG Project Construction Phase

TITLE: Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (April 20, 2024)

PROJECT #: A633-7 FIGURE: 1

P:\@Drafting\Woodfibre\Drafting Figures\APRX\WLNG Construction Phase 2024\WLNG Construction Phase 2024 - Weekly Reporting.aprx Figure 1 Monitoring and Compliance Locations

Appendix A: East and West Catchment Photographs

Figure 2. Viewing northeast from the southern corner of the East Sedimentation Pond (April 16, 2024).

Figure 3: Areal view of the East WWTP and East Sedimentation Pond showing the placement of two sediment curtains. Water at the inlet (southwest) section of the pond is brown due to elevated TSS in the influent. The progression to clear water at the outlet (northern) end illustrates how TSS is held back by the curtains while allowing clarified water to pass through (April 19, 2024).

Figure 4: Viewing east from the southwestern corner of the West Sedimentation Pond (April 16, 2024).

Figure 5: Areal view showing the current stage of construction for the West Sedimentation Pond and West WWTP (western edges of pond) on April 19, 2024.

Appendix B: East Sedimentation Pond Results

Table B-1: Summary of East Sedimentation Pond Water Quality Results Received at the Time of Reporting.

Parameter	Units	Lowest Applicable Marine Water Guideline [1, 2]		PE-111578 Discharge Limit *	East Sedimentation Pond		
					Influent	Effluent	Pond Water
					SP-E-IN-2	SP-E-OUT	SP-E-POND
					VA24A8074-007	VA24A8074-006	VA24A8366-001
		Long Term	Short Term		2024-04-16	2024-04-16	2024-04-18
General Parameters							
pH - Field	pH units	- [5]	-	5.5 - 9.0	10.69	8.65	-
Specific Conductivity - Field	µS/cm	-	-	-	343	191	-
Temperature - Field	°C	-	-	-	17	12.5	-
Salinity - Field	ppt	-	-	-	0.19	0.12	-
Turbidity - Field	NTU	-	-	-	2603	12.27	-
TSS	mg/L	- [5]	-	25	26000	10.2	-
Dissolved Oxygen - Field	mg/L	>=8	-	-	***7.04***	10.72	-
Anions and Nutrients							
Sulphate	mg/L	-	-	-	64.4	25.3	-
Chloride	mg/L	-	-	-	22.8	13.1	-
Fluoride	mg/L	-	1.5	-	0.193	0.097	-
Ammonia ($N\text{-}NH_3$)	mg/L	Variable [4]	Variable [4]	-	0.412	<0.0050	-
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	-	0.0331	0.0467	-
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	339	-	0.0759	0.0430	-
Total Metals							
Aluminum, total (T-Al)	mg/L	-	-	-	915	0.849	-
Antimony, total (T-Sb)	mg/L	-	0.27 [5]	-	0.0132	0.00209	-
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	***0.176***	0.00341	-
Barium, total (T-Ba)	mg/L	-	-	-	6.82	0.00827	-
Beryllium, total (T-Be)	mg/L	0.1	-	-	0.0182	<0.0001	-
Boron, total (T-B)	mg/L	1.2	-	-	***1.27***	0.022	-
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	***0.0342***	0.0000191	-
Chromium, total (T-Cr)	mg/L	-	-	-	0.877	0.00187	-
Cobalt, total (T-Co)	mg/L	-	-	-	0.331	0.00028	-
Copper, total (T-Cu)	mg/L	- [5]	- [5]	0.0043	2.70	0.00290	-
Iron, total (T-Fe)	mg/L	-	-	-	554	0.472	-
Lead, total (T-Pb)	mg/L	- [5]	- [5]	0.0035	2.76	0.00251	-
Manganese, total (T-Mn)	mg/L	-	-	-	21.3	0.0142	-
Mercury, total (T-Hg)	mg/L	0.000016	-	-	***0.0202***	0.0000081	-
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0309	0.0176	-
Nickel, total (T-Ni)	mg/L	0.0083	-	-	***0.619***	0.00062	-
Selenium, total (T-Se)	mg/L	0.002	-	-	***0.00544***	0.000147	-
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	***0.0100***	<0.00001	-
Thallium, total (T-Tl)	mg/L	-	-	-	0.00603	0.000017	-
Uranium, total (T-U)	mg/L	-	-	-	0.549	0.00980	-
Vanadium, total (T-V) [8]	mg/L	- [5]	-	0.0081	1.16	0.00540	-
Zinc, total (T-Zn)	mg/L	- [5]	- [5]	0.0133	7.11	0.0071	-
Hexavalent Chromium, total	mg/L	0.0015	-	-	***0.00202***	0.00118	-
Dissolved Metals							
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.00002	<0.000005	-
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00271	0.00122	-
Iron, dissolved (D-Fe)	mg/L	-	-	-	0.015	<0.01	-
Lead, dissolved (D-Pb)	mg/L	-	-	-	0.000055	<0.00005	-
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00166	0.00094	-
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.145	0.102	-
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.0808	0.00376	-
Zinc, dissolved (D-Zn)	mg/L	-	-	-	<0.001	<0.001	-
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	mg/L	0.006	-	-	***0.00637***	<0.00001	<0.00001
Acridine	mg/L	-	-	-	<0.00161	<0.00001	<0.00001
Anthracene	mg/L	-	-	-	0.00772	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	-	0.0185	0.000012	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	-	***0.0147***	***0.0000114***	<0.000005
Chrysene	mg/L	0.0001	-	-	***0.0173***	0.000013	<0.00001
Fluoranthene	mg/L	-	-	-	0.0427	0.000040	0.000013
Fluorene	mg/L	0.012	-	-	0.00486	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	-	***0.00234***	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	-	***0.00319***	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	-	***0.00326***	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	-	0.0317	<0.00002	<0.00002
Pyrene	mg/L	-	-	-	0.0382	0.000029	<0.00001
Volatile Organic Compounds (VOCs)							
Benzene	mg/L	0.11	-	-	<0.0005	<0.0005	-
Ethylbenzene	mg/L	0.25	-	-	<0.0005	<0.0005	-
Methyl-tert-butyl-ether	mg/L	5	0.44	-	<0.0005	<0.0005	-
Styrene	mg/L	-	-	-	<0.0005	<0.0005	-
Toluene	mg/L	0.215	-	-	<0.0004	<0.0004	-
Total Xylenes	mg/L	-	-	-	<0.0005	<0.0005	-
Chlorobenzene	mg/L	0.025	-	-	<0.0005	<0.0005	-
1,2-Dichlorobenzene	mg/L	0.042	-	-	<0.0005	<0.0005	-

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of freshwater aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of freshwater aquatic life.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of freshwater aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of freshwater aquatic life (CCME, 2021). Federal Water Quality Guidelines (FWQG) are used for total Al, Co, and V, and for dissolved Cu, Sr, and Pb (Environment and Climate Change Canada).
[3] BC WQG or CWQG indicated to be variable are calculated from sample-specific measurements for temperature, field pH, total hardness and dissolved organic carbon (DOC) content.
[4] When MeHg $\leqslant$ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[5] Where discharge limits apply, the water quality guideline was not evaluated.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Table B-2: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

Station ID	Date	Time	Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen
			°C	mg/L	ppt	NTU	s.u.	µS/cm	
SP-E-OUT	15-04-2024	13:05	12.1	9.84	0.75	11.09	7.11	1111	No
SP-E-IN-2	16-04-2024	16:08	17	7.04	0.19	2602.81	10.69	343	No
SP-E-OUT	16-04-2024	14:53	12.5	10.72	0.12	12.27	8.65	191	No
SP-E-OUT	17-04-2024	14:42	12.7	10.68	0.15	9.9	7.33	236	No
SP-E-IN-2	17-04-2024	15:05	21.2	6.78	0.26	253.75	8.69	489	No
SP-E-OUT	18-04-2024	-	-	-	-	-	-	-	-
SP-E-IN-2	18-04-2024	-	-	-	-	-	-	-	-
SP-E-OUT	19-04-2024	-	-	-	-	-	-	-	-
SP-E-IN-2	19-04-2024	-	-	-	-	-	-	-	-
SP-E-OUT	20-04-2024	13:20	14.9	9.48	0.15	1.03	7.34	248.1	No
SP-E-IN-2	20-04-2024	-	-	-	-	-	-	-	-

No water sources were pumped to the East Sedimentation Pond April 18 – April 20, therefore station SP-E-In-2 was not sampled.
Intermittent discharge from the East Sedimentation Pond occurred April 15 – 17 and April 20.

Appendix C: East Wastewater Treatment Plant Results

Table C-1: Summary of East Wastewater Treatment Plant Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Minimum Discharge Objective[1]	East WWTP	
			Influent	Effluent
			WWTP-E-IN	WWTP-E-OUT
			VA24A8074-001	VA24A8074-002
			2024-04-16	2024-04-16
General Parameters				
pH - Field	pH units	7.0 - 8.7	***9.71***	8.8
Specific Conductivity - Field	µS/cm	-	191	193
Temperature - Field	°C	-	11.4	12.2
Salinity - Field	ppt	-	0.12	0.12
Turbidity - Field	NTU	-	62.09	0.6
TSS	mg/L	-	55.8	<3
Dissolved Oxygen - Field	mg/L	>=8	10.66	11.79
Anions and Nutrients				
Sulphate	mg/L	-	26.1	25.4
Chloride	mg/L	-	12.7	13.0
Fluoride	mg/L	-	0.111	0.099
Ammonia (N-NH_3)	mg/L	Variable [4]	0.0122	0.0064
Nitrite (N-NO_2)	mg/L	-	0.0630	0.0508
Nitrate (N-NO_3)	mg/L	3.7	0.115	0.0510
Total Metals				
Aluminum, total (T-Al)	mg/L	-	4.69	0.111
Antimony, total (T-Sb)	mg/L	-	0.00206	0.00201
Arsenic, total (T-As)	mg/L	0.0125	0.00474	0.00309
Barium, total (T-Ba)	mg/L	-	0.0337	0.00211
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.048	0.019
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000909	0.0000056
Chromium, total (T-Cr)	mg/L	-	0.00505	0.00131
Cobalt, total (T-Co)	mg/L	-	0.00143	<0.0001
Copper, total (T-Cu)	mg/L	0.002	***0.0117***	0.00173
Iron, total (T-Fe)	mg/L	-	2.96	<0.01
Lead, total (T-Pb)	mg/L	0.002	***0.0119***	0.000196
Manganese, total (T-Mn)	mg/L	-	0.0779	0.00150
Mercury, total (T-Hg)	mg/L	0.000016	***0.0000237***	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0236	0.0184
Nickel, total (T-Ni)	mg/L	0.0083	0.00255	<0.0005
Selenium, total (T-Se)	mg/L	0.002	0.000196	0.000188
Silver, total (T-Ag)	mg/L	0.0015	0.000033	<0.00001
Thallium, total (T-Tl)	mg/L	-	0.000028	0.000013
Uranium, total (T-U)	mg/L	-	0.0132	0.00973
Vanadium, total (T-V) [8]	mg/L	0.005	***0.0134***	0.00406
Zinc, total (T-Zn)	mg/L	0.01	***0.0316***	<0.003
Hexavalent Chromium, total	mg/L	0.0015	***0.00166***	0.00108
Dissolved Metals				
Cadmium, dissolved (D-Cd)	mg/L	-	<0.000005	<0.000005
Copper, dissolved (D-Cu)	mg/L	-	0.00180	0.00149
Iron, dissolved (D-Fe)	mg/L	-	<0.01	<0.01
Lead, dissolved (D-Pb)	mg/L	-	<0.00005	0.000060
Manganese, dissolved (D-Mn)	mg/L	-	0.00051	0.00121
Strontium, dissolved (D-Sr)	mg/L	-	0.0976	0.102
Vanadium, dissolved (D-V)	mg/L	-	0.00614	0.00368
Zinc, dissolved (D-Zn)	mg/L	-	<0.001	0.0018
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	mg/L	0.006	0.000027	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001
Anthracene	mg/L	-	0.000014	<0.00001
Benz(a)anthracene	mg/L	-	0.000047	<0.00001
Benzo(a)pyrene	mg/L	0.00001	***0.0000458***	<0.000005
Chrysene	mg/L	0.0001	0.000060	<0.00001
Fluoranthene	mg/L	-	0.000165	<0.00001
Fluorene	mg/L	0.012	0.000020	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005
Phenanthrene	mg/L	-	0.000072	<0.00002
Pyrene	mg/L	-	0.000130	<0.00001
Volatile Organic Compounds (VOCs)				
Benzene	mg/L	0.11	<0.0005	<0.0005
Ethylbenzene	mg/L	0.25	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	5	<0.0005	<0.0005
Styrene	mg/L	-	<0.0005	<0.0005
Toluene	mg/L	0.215	<0.0004	<0.0004
Total Xylenes	mg/L	-	<0.0005	<0.0005
Chlorobenzene	mg/L	0.025	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	0.042	<0.0005	<0.0005

Notes:
[1] Minimum discharge objective for the WWTP effluent.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Table C-2: Summary of East Wastewater Treatment Plant Daily Field Parameters Received at the Time of Reporting.

Station ID	Date	Time	Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen
			°C	mg/L	ppt	NTU	s.u.	µS/cm	
WWTP-E-IN	16-04-2024	14:26	11.4	10.66	0.12	62.09	9.71	191	No
WWTP-E-OUT	16-04-2024	13:49	12.2	11.79	0.12	0.6	8.8	193	No
WWTP-E-IN	17-04-2024	14:55	12.1	10.13	0.14	92.37	7.83	223	No
WWTP-E-OUT	17-04-2024	14:52	12.7	11.16	0.17	1.46	6.6	266	No
WWTP-E-IN	18-04-2024	13:48	16.6	8.82	0.13	43.37	8.66	231.1	No
WWTP-E-OUT	18-04-2024	13:43	13.4	13.89	0.17	0.23	7.09	266.3	No
WWTP-E-IN	19-04-2024	13:35	15.4	8.3	0.13	24.05	8.45	227.7	No
WWTP-E-OUT	19-04-2024	13:32	13.9	8.61	0.14	0.05	7.84	288.4	No
WWTP-E-IN	20-04-2024	13:11	13.7	9.87	0.13	12	8.37	217.7	No
WWTP-E-OUT	20-04-2024	13:07	21.6	5.61	0.14	0.86	7.41	270.5	No

Appendix D: Freshwater Receiving Environment Results

Table D-1: Summary of Freshwater Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station OUT-06 Non-Contact Water Diversion Ditch Outlet OUT-06 VA24A7873-006
		Long Term	Short Term	2024-04-12
General Parameters				
pH - Field	pH units	6.5 - 9.0	-	6.66
Specific Conductivity - Field	µS/cm	-	-	59
Temperature - Field	°C	-	-	13
Salinity - Field	ppt	-	-	0.04
Turbidity - Field	NTU	-	-	0.19
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	10.82
Anions and Nutrients				
Sulphate	mg/L	218 [3]	-	3.9
Chloride	mg/L	120	600	<0.5
Fluoride	mg/L	-	0.91 [3]	<0.02
Ammonia (N-NH_3)	mg/L	1.8 [3]	10.3 [3]	<0.005
Nitrite (N-NO_2)	mg/L	0.02 [3]	0.06 [3]	<0.001
Nitrate (N-NO_3)	mg/L	3	32.8	0.154
Total Metals				
Aluminum, total (T-Al)	mg/L	0.086 [3]	-	***0.190***
Antimony, total (T-Sb)	mg/L	0.074	-	0.00031
Arsenic, total (T-As)	mg/L	0.005	-	0.00038
Barium, total (T-Ba)	mg/L	1	-	0.00840
Beryllium, total (T-Be)	mg/L	0.00013	-	<0.0001
Boron, total (T-B)	mg/L	1.2	29	0.012
Cadmium, total (T-Cd)	mg/L	0.000066 [3]	0.00072 [3]	0.0000080
Chromium, total (T-Cr) [5]	mg/L	0.001	-	<0.0005
Cobalt, total (T-Co)	mg/L	0.001	0.11	<0.0001
Copper, total (T-Cu)	mg/L	-	-	0.00103
Iron, total (T-Fe)	mg/L	0.3	1	0.049
Lead, total (T-Pb)	mg/L	0.0041 [3]	0.021 [3]	0.000258
Manganese, total (T-Mn)	mg/L	0.77 [3]	0.93 [3]	0.00214
Mercury, total (T-Hg)	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	0.073	46	0.00129
Nickel, total (T-Ni)	mg/L	0.025 [3]	-	<0.0005
Selenium, total (T-Se)	mg/L	0.001	-	<0.00005
Silver, total (T-Ag)	mg/L	0.00005 [3]	0.0001 [3]	<0.00001
Thallium, total (T-Tl)	mg/L	0.0008	-	<0.00001
Uranium, total (T-U)	mg/L	0.0085	0.033	0.000208
Vanadium, total (T-V)	mg/L	0.12	-	0.00093
Zinc, total (T-Zn)	mg/L	-	-	<0.003
Hexavalent Chromium, total	mg/L	0.001	-	-
Dissolved Metals				
Cadmium, dissolved (D-Cd)	mg/L	0.000098 [3]	0.00020 [3]	0.0000053
Copper, dissolved (D-Cu)	mg/L	0.0003 [3]	0.0017 [3]	***0.00090***
Iron, dissolved (D-Fe)	mg/L	-	0.35	0.010
Lead, dissolved (D-Pb)	mg/L	0.0065 [3]	-	0.000060
Manganese, dissolved (D-Mn)	mg/L	0.33 [3]	2.65 [3]	0.00111
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.0490
Vanadium, dissolved (D-V)	mg/L	-	-	0.00069
Zinc, dissolved (D-Zn)	mg/L	0.011 [3]	0.023 [3]	<0.001
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	mg/L	0.0058	-	-
Acridine	mg/L	0.003	-	-
Anthracene	mg/L	0.000012	-	-
Benz(a)anthracene	mg/L	0.000018	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-
Chrysene	mg/L	-	-	-
Fluoranthene	mg/L	0.00004	-	-
Fluorene	mg/L	0.003	-	-
1-methylnaphthalene	mg/L	-	-	-
2-methylnaphthalene	mg/L	-	-	-
Naphthalene	mg/L	0.001	0.001	-
Phenanthrene	mg/L	0.0003	-	-
Pyrene	mg/L	0.00002	-	-
Volatile Organic Compounds (VOCs)				
Benzene	mg/L	0.04	-	-
Ethylbenzene	mg/L	0.09	-	-
Methyl-tert-butyl-ether	mg/L	10	3.4	-
Styrene	mg/L	0.072	-	-
Toluene	mg/L	0.0005	-	-
Total Xylenes	mg/L	0.03	-	-
Chlorobenzene	mg/L	-	-	-
1,2-Dichlorobenzene	mg/L	-	-	-

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of freshwater aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of freshwater aquatic life.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of freshwater aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of freshwater aquatic life (CCME, 2021). Federal Water Quality Guidelines (FWQG) are used for total Al, Co, and V, and for dissolved Cu, Sr, and Pb (Environment and Climate Change Canada).
[3] BC WQG or CWQG indicated to be variable are calculated from sample-specific measurements for temperature, field pH, total hardness and dissolved organic carbon (DOC) content.
[4] When MeHg $\leqslant$ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[5] The approved BC WQG for hexavalent chromium [Cr(VI)] is 0.001 mg/L and 0.0089 mg/L for trivalent chromium [Cr(III)]. The more conservative criteria for Cr(VI) is applied to total chromium results.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Appendix E: Marine Water Receiving Environment Results

Table E-1: Summary of Marine Water Quality Results Received at the Time of Reporting

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station IDZ-E1			Station IDZ-E2		
				0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
				IDZ-E1-0.5	IDZ-E1-2m	IDZ-E1-SF	IDZ-E2-0.5	IDZ-E2-2m	IDZ-E2-SF
				VA24A8074-008	VA24A8074-009	VA24A8074-010	VA24A8074-011	VA24A8074-012	VA24A8074-013
		Long Term	Short Term	2024-04-16	2024-04-16	2024-04-16	2024-04-16	2024-04-16	2024-04-16
General Parameters									
pH - Field	pH units	7.0 - 8.7	-	8.34	8.48	7.81	8.10	8.48	7.61
Specific Conductivity - Field	µS/cm	-	-	7800	26200	30670	6900	25980	31460
Temperature - Field	℃	-	-	8.8	10.8	8.8	8.1	10.7	8.4
Salinity - Field	ppt	Narrative[3]	-	6.47	22.66	28.47	5.75	22.46	29.57
Turbidity - Field	NTU	Narrative[3]	Narrative[3]	0.59	0.64	<0.01	0.48	0.38	<0.01
TSS	mg/L	Narrative[3]	Narrative[3]	6.4	3.2	<3.0	3.2	3.8	<3.0
Dissolved Oxygen - Field	mg/L	>=8	-	12.55	13.26	9.00	12.18	12.97	***7.34***
Anions and Nutrients									
Sulphate	mg/L	-	-	-	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-	-	-	-
Ammonia ($N\text{-}NH_3$)	mg/L	Variable [4]	Variable [4]	-	-	-	-	-	-
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	-	-	-	-	-	-
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	339	-	-	-	-	-	-
Total Metals									
Aluminum, total (T-Al)	mg/L	-	-	<0.06	<0.15	<0.15	0.0736	<0.15	<0.06
Antimony, total (T-Sb)	mg/L	-	0.27 [5]	<0.002	<0.005	<0.005	<0.002	<0.005	<0.002
Arsenic, total (T-As)	mg/L	0.0125	0.0125	<0.002	<0.005	<0.005	<0.002	<0.005	<0.002
Barium, total (T-Ba)	mg/L	-	-	0.00869	0.00803	0.0106	0.00990	0.00858	0.0101
Beryllium, total (T-Be)	mg/L	0.1	-	<0.0004	<0.001	<0.001	<0.0004	<0.001	<0.0004
Boron, total (T-B)	mg/L	1.2	-	***2.81***	***2.95***	***3.70***	***1.31***	***2.90***	***3.37***
Cadmium, total (T-Cd)	mg/L	0.00012	-	<0.0001	***<0.00025***	***<0.00025***	<0.0001	***<0.00025***	<0.0001
Chromium, total (T-Cr)	mg/L	-	-	<0.01	<0.025	<0.025	<0.01	<0.025	<0.01
Cobalt, total (T-Co)	mg/L	-	-	<0.002	<0.005	<0.005	<0.002	<0.005	<0.002
Copper, total (T-Cu)	mg/L	0.002	0.003	***<0.01***	***<0.025***	***<0.025***	***<0.01***	***<0.025***	***<0.01***
Iron, total (T-Fe)	mg/L	-	-	<0.2	<0.5	<0.5	<0.2	<0.5	<0.2
Lead, total (T-Pb)	mg/L	0.002	0.14	<0.001	***<0.0025***	***<0.0025***	<0.001	***<0.0025***	<0.001
Manganese, total (T-Mn)	mg/L	-	-	0.00495	<0.005	<0.005	0.0103	<0.005	0.00307
Mercury, total (T-Hg)	mg/L	0.000016	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.00762	0.00787	0.00992	0.00376	0.00766	0.00978
Nickel, total (T-Ni)	mg/L	0.0083	-	***<0.01***	***<0.025***	***<0.025***	***<0.01***	***<0.025***	***<0.01***
Selenium, total (T-Se)	mg/L	0.002	-	<0.001	***<0.0025***	***<0.0025***	<0.001	***<0.0025***	<0.001
Silver, total (T-Ag)	mg/L	0.0015	0.003	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Thallium, total (T-Tl)	mg/L	-	-	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Uranium, total (T-U)	mg/L	-	-	0.00224	0.00229	0.00290	0.00107	0.00230	0.00275
Vanadium, total (T-V)	mg/L	0.005 [7]	-	***<0.01***	***<0.025***	***<0.025***	***<0.01***	***<0.025***	***<0.01***
Zinc, total (T-Zn)	mg/L	0.01	0.055	***<0.06***	***<0.15***	***<0.15***	***<0.06***	***<0.15***	***<0.06***
Hexavalent Chromium, total	mg/L	0.0015	-	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dissolved Metals									
Cadmium, dissolved (D-Cd)	mg/L	-	-	<0.00025	<0.00025	<0.00025	<0.0001	<0.00025	<0.00025
Copper, dissolved (D-Cu)	mg/L	-	-	<0.01	<0.01	<0.01	<0.004	<0.01	<0.01
Iron, dissolved (D-Fe)	mg/L	-	-	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5
Lead, dissolved (D-Pb)	mg/L	-	-	<0.0025	<0.0025	<0.0025	<0.001	<0.0025	<0.0025
Manganese, dissolved (D-Mn)	mg/L	-	-	<0.005	<0.005	<0.005	0.00846	<0.005	<0.005
Strontium, dissolved (D-Sr)	mg/L	-	-	5.21	5.46	6.21	2.43	5.00	6.02
Vanadium, dissolved (D-V)	mg/L	-	-	<0.025	<0.025	<0.025	<0.01	<0.025	<0.025
Zinc, dissolved (D-Zn)	mg/L	-	-	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05
Polycyclic Aromatic Hydrocarbons (PAHs)									
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-
Acridine	mg/L	-	-	-	-	-	-	-	-
Anthracene	mg/L	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-	-	-	-	-	-
Chrysene	mg/L	0.0001	-	-	-	-	-	-	-
Fluoranthene	mg/L	-	-	-	-	-	-	-	-
Fluorene	mg/L	0.012	-	-	-	-	-	-	-
1-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
2-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-
Phenanthrene	mg/L	-	-	-	-	-	-	-	-
Pyrene	mg/L	-	-	-	-	-	-	-	-
Volatile Organic Compounds (VOCs)									
Benzene	mg/L	0.11	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.25	-	-	-	-	-	-	-
Methyl-tert-butyl-ether	mg/L	5	0.44	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	-	-	-	-
Toluene	mg/L	0.215	-	-	-	-	-	-	-
Total Xylenes	mg/L	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	0.025	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.042	-	-	-	-	-	-	-

Notes:

Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.

Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.

Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.

* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).

[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.

[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

[3] Narrative guideline for the evaluation of change from background conditions arising from discharges to the aquatic environment. The water quality data presented in the table were collected when the site was discharging, therefore the guidelines were evaluated.

[4] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).

[5] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.

[6] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

[7] Federal Water Quality Guideline for Vanadium (Environment and Climate Change Canada).

The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.